

Scaling PHP Applications with Couchbase

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Couchbase

Who's this guy?

- **SDK Engineer at Couchbase**
 - Maintaining
 - Official Java SDK
 - Spymemcached
 - Spring-Data-Couchbase
- **Former Lithium Core Contributor**
- **@daschl on Twitter**





RDBMS are not Enough?

Growth is the New Reality

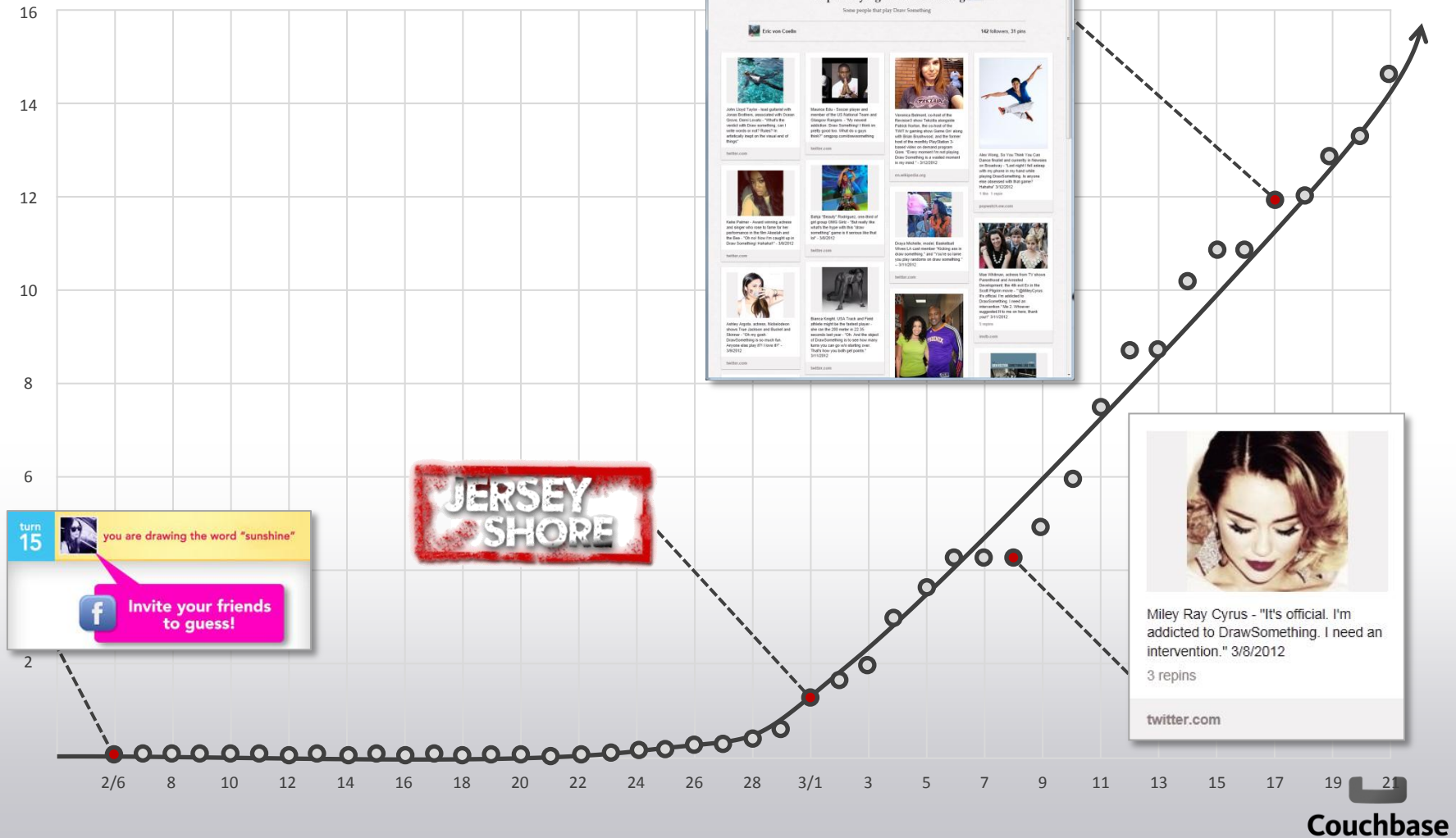
Instagram gained nearly 1 million users overnight when then expanded to Android



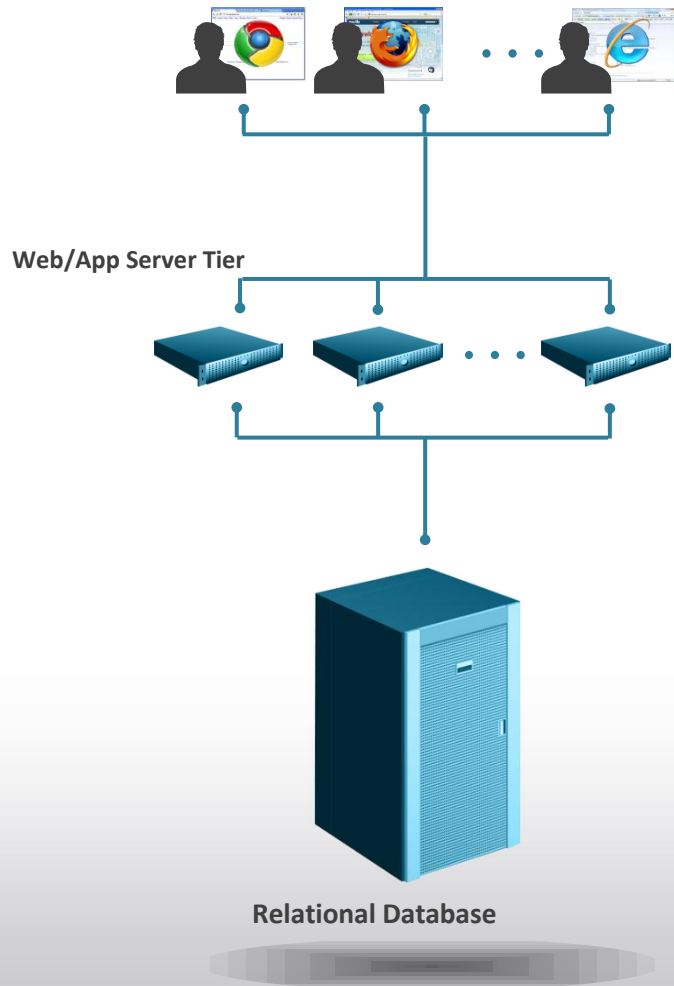
Draw Something Viral Growth

Draw Something by OMGPOP

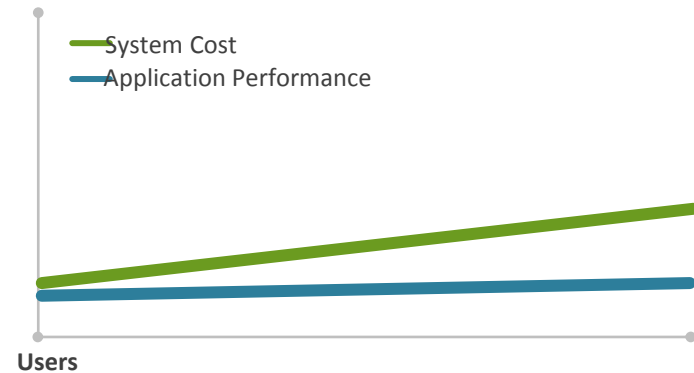
Daily Active Users (millions)



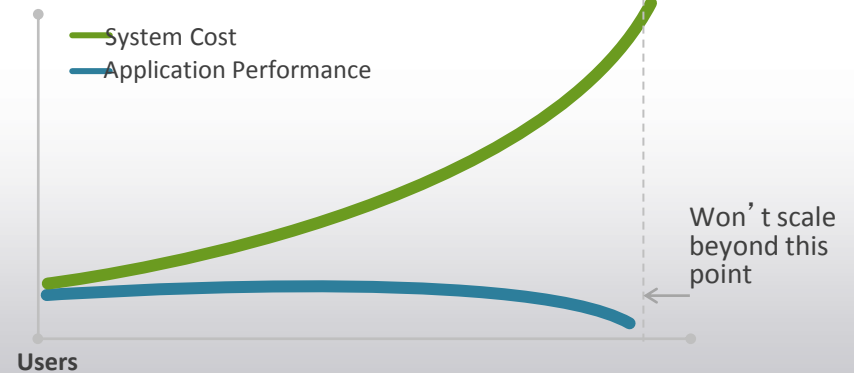
How do you take this growth?



Application Scales Out
Just add more commodity web servers

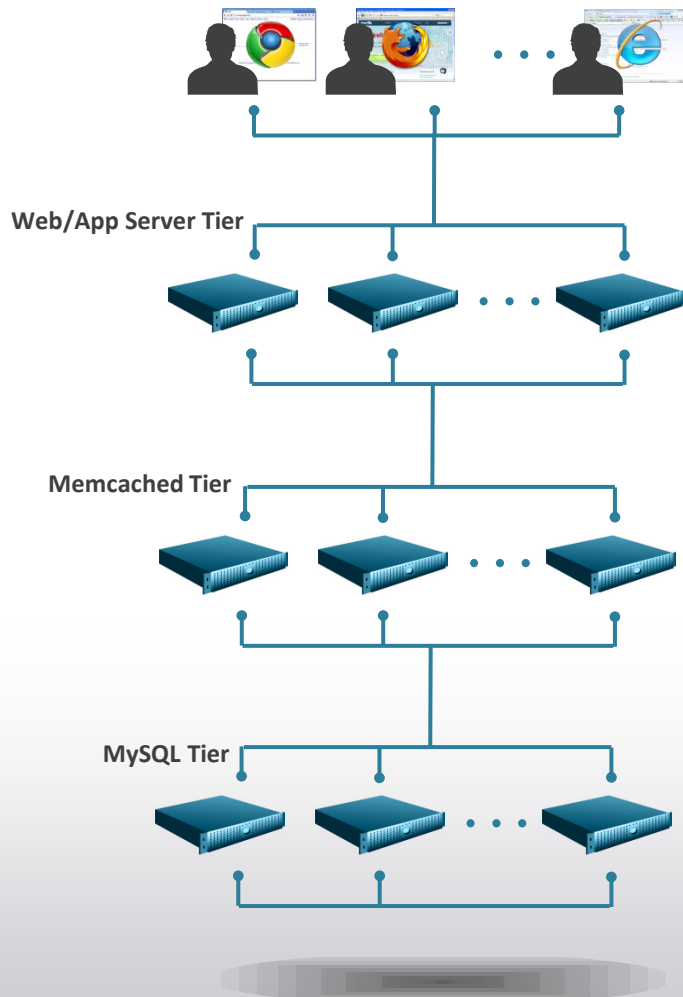


RDBMS Scales Up
Get a bigger, more complex server



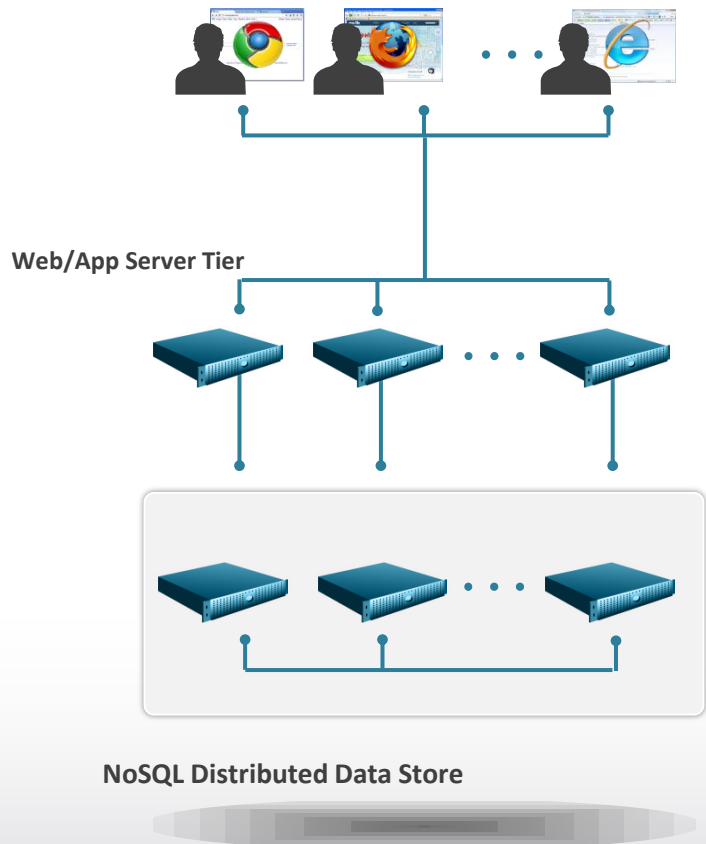
RDBMS is good for many thing, but hard to scale

Scaling out RDBMS

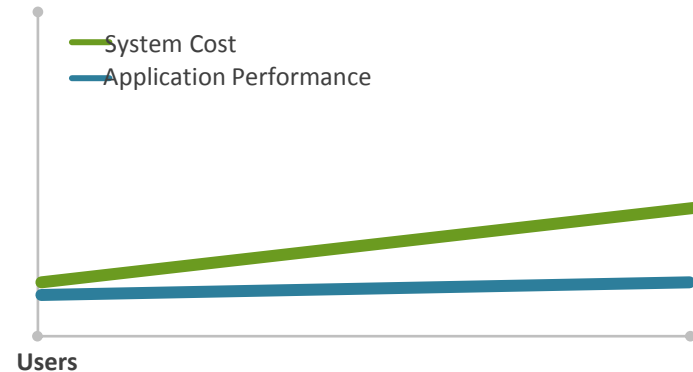


- Run Many SQL Servers
- Data could be shared
 - Done by the application code
- Caching for faster response time

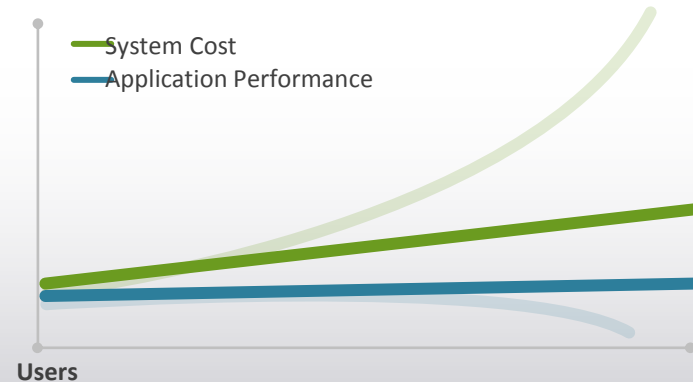
NoSQL Technology Scales Out



Application Scales Out
Just add more commodity web servers



NoSQL Database Scales Out
Cost and performance mirrors app tier



Scaling out flattens the cost *and* performance curves



Couchbase

Couchbase Open Source Project

- Leading NoSQL database project focused on distributed database technology and surrounding ecosystem
- Supports both key-value and document-oriented use cases
- All components are available under the **Apache 2.0 Public License**
- Obtained as packaged software in both enterprise and community editions.



Couchbase Handles Real World Scale



Couchbase

Couchbase

Couchbase Server Core Principles



Easy Scalability

Grow cluster without application changes, without downtime with a single click



Consistent High Performance

Consistent sub-millisecond read and write response times with consistent high throughput



Always On 24x365

No downtime for software upgrades, hardware maintenance, etc.



Flexible Data Model

JSON document model with no fixed schema.



New in 2.0+

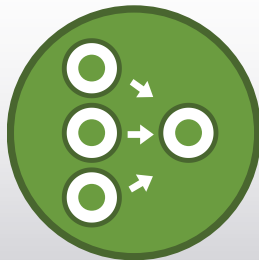
JSON support



Indexing and Querying



Incremental Map Reduce



Cross data center replication

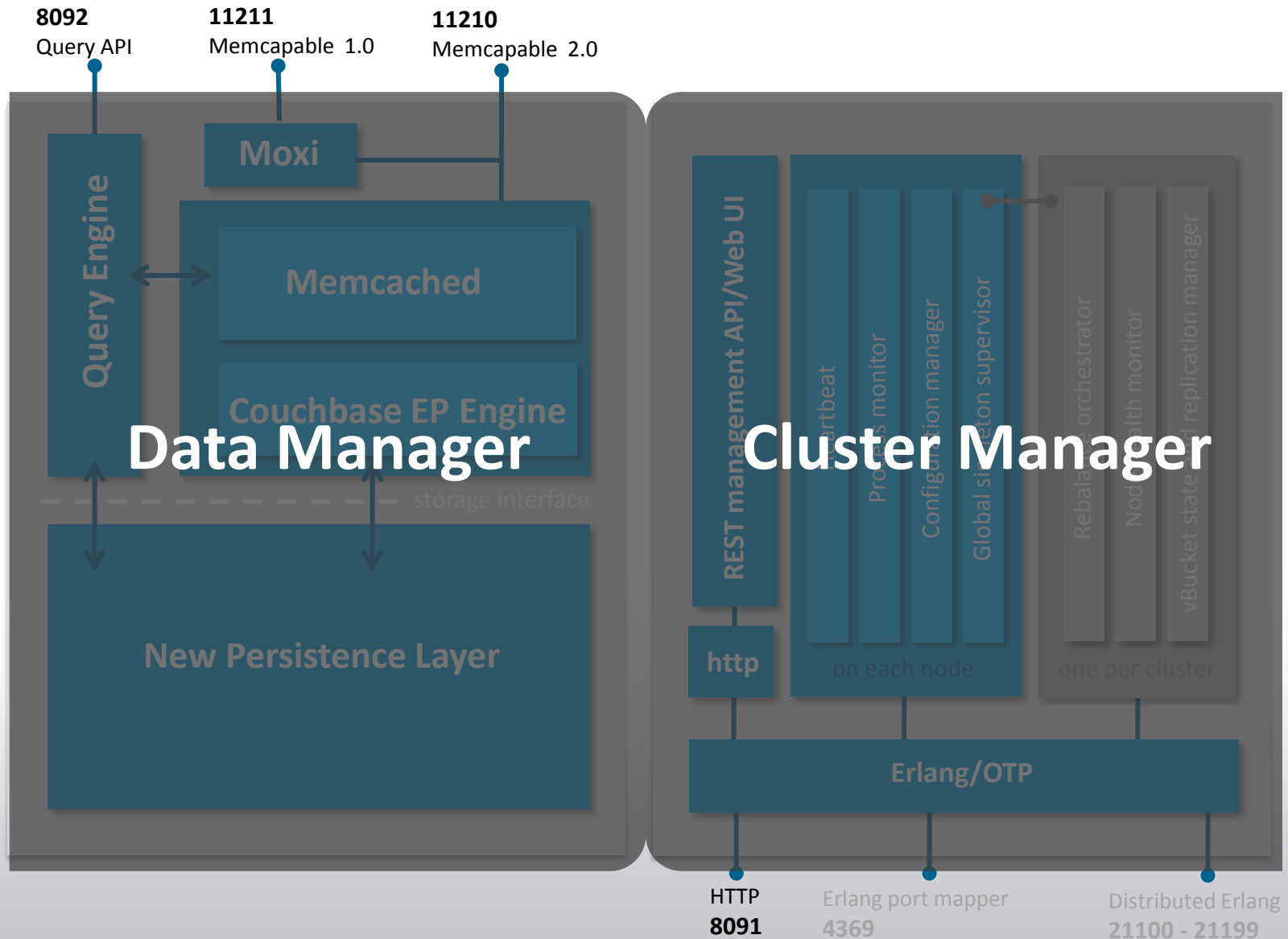




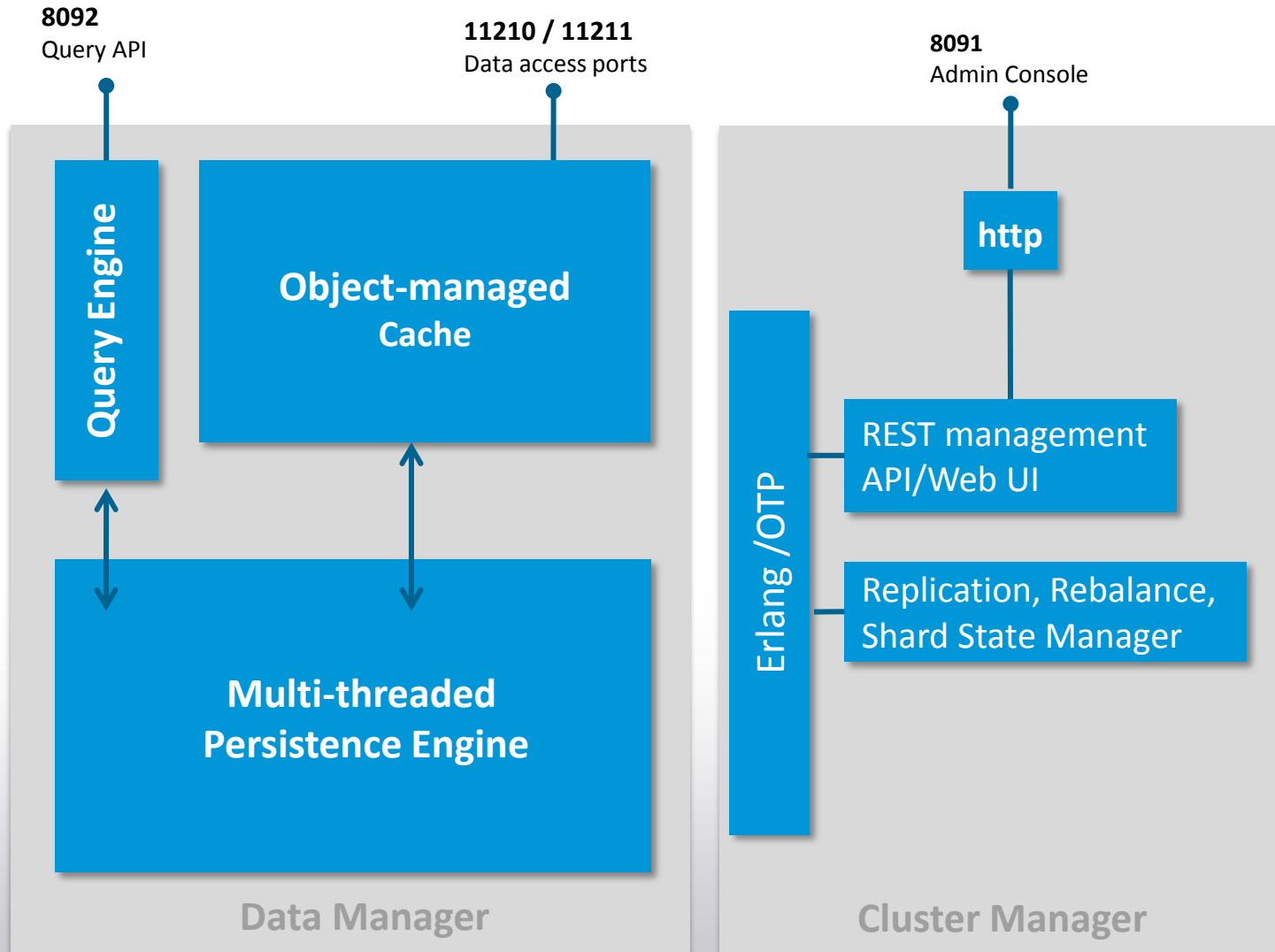
Architecture & Operations



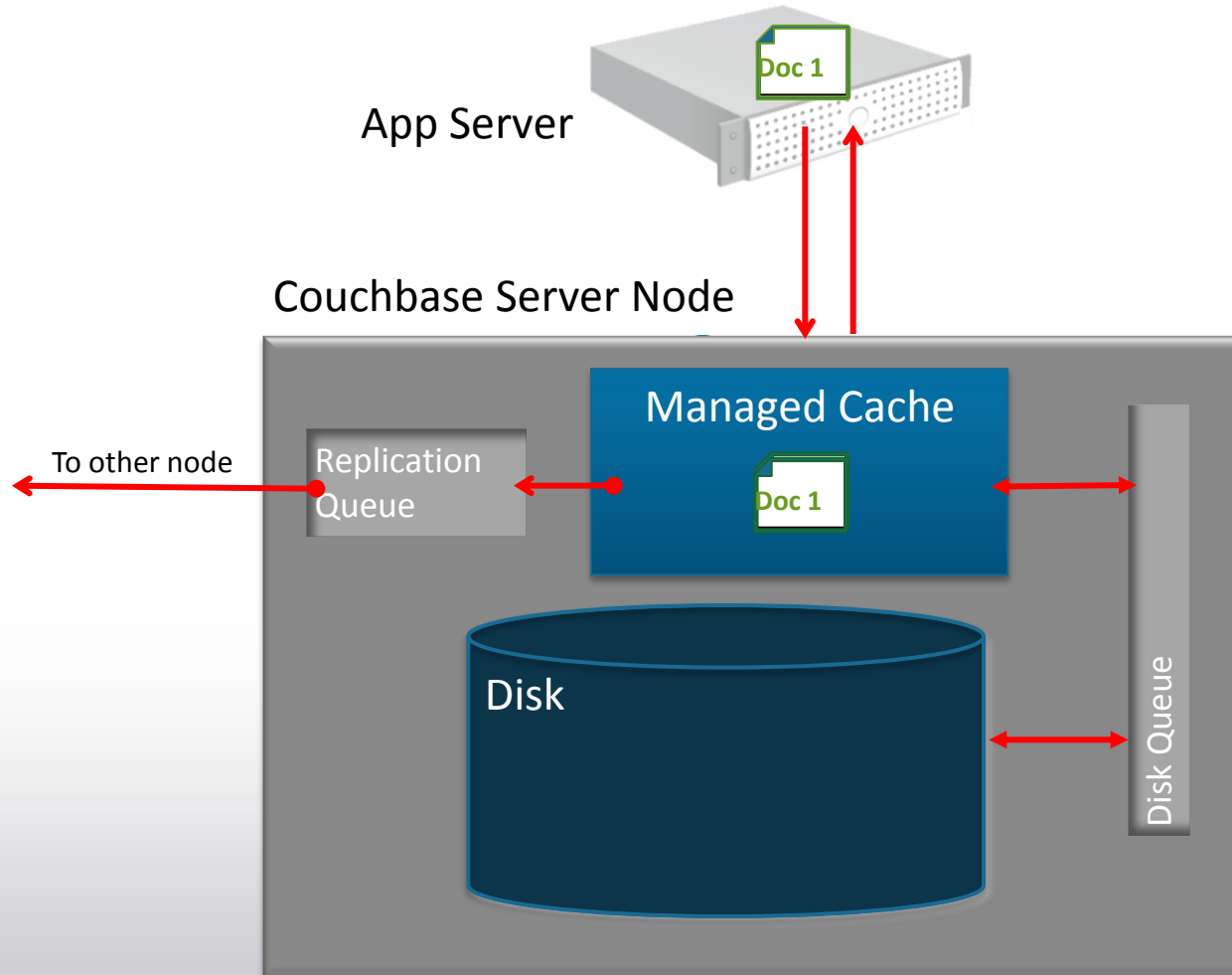
Couchbase Server Architecture



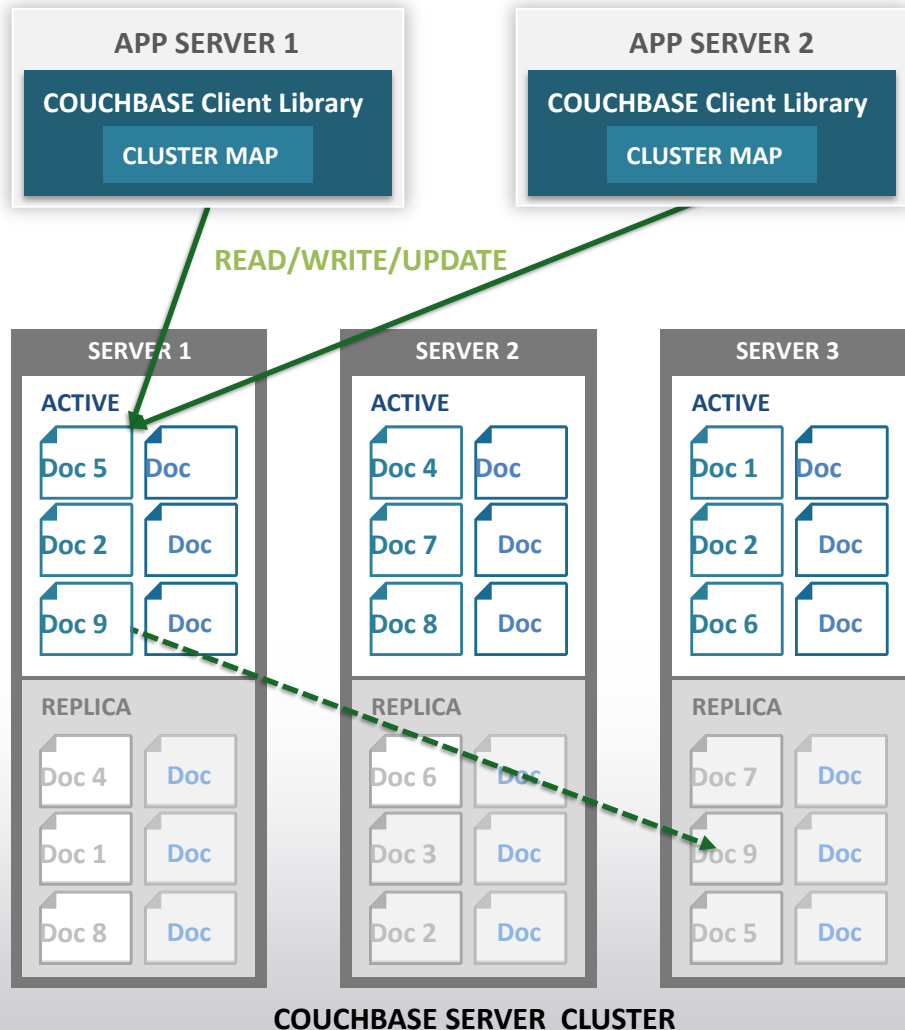
Couchbase Server Architecture



Single node - Couchbase Write Operation

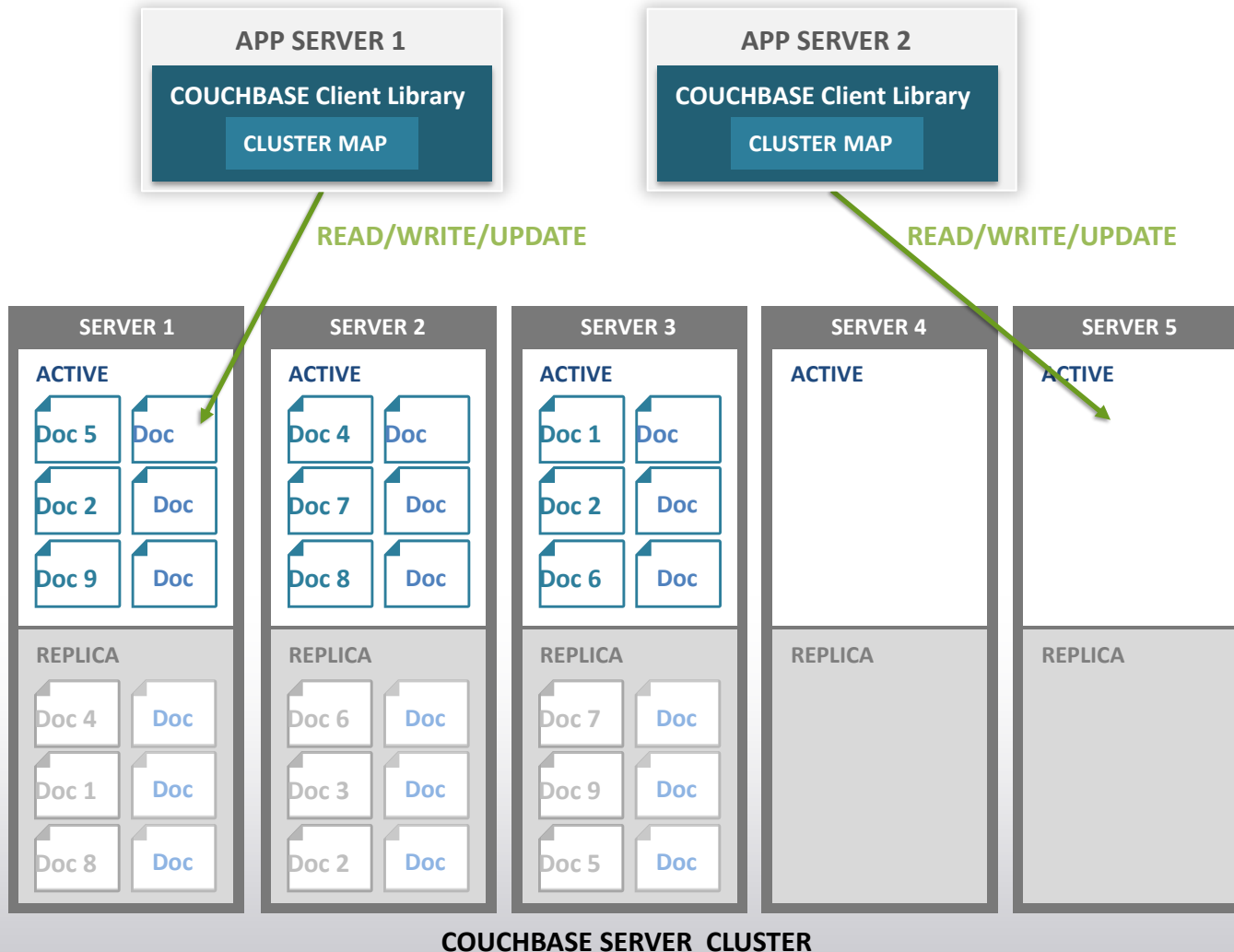


Cluster-wide Basic Operation



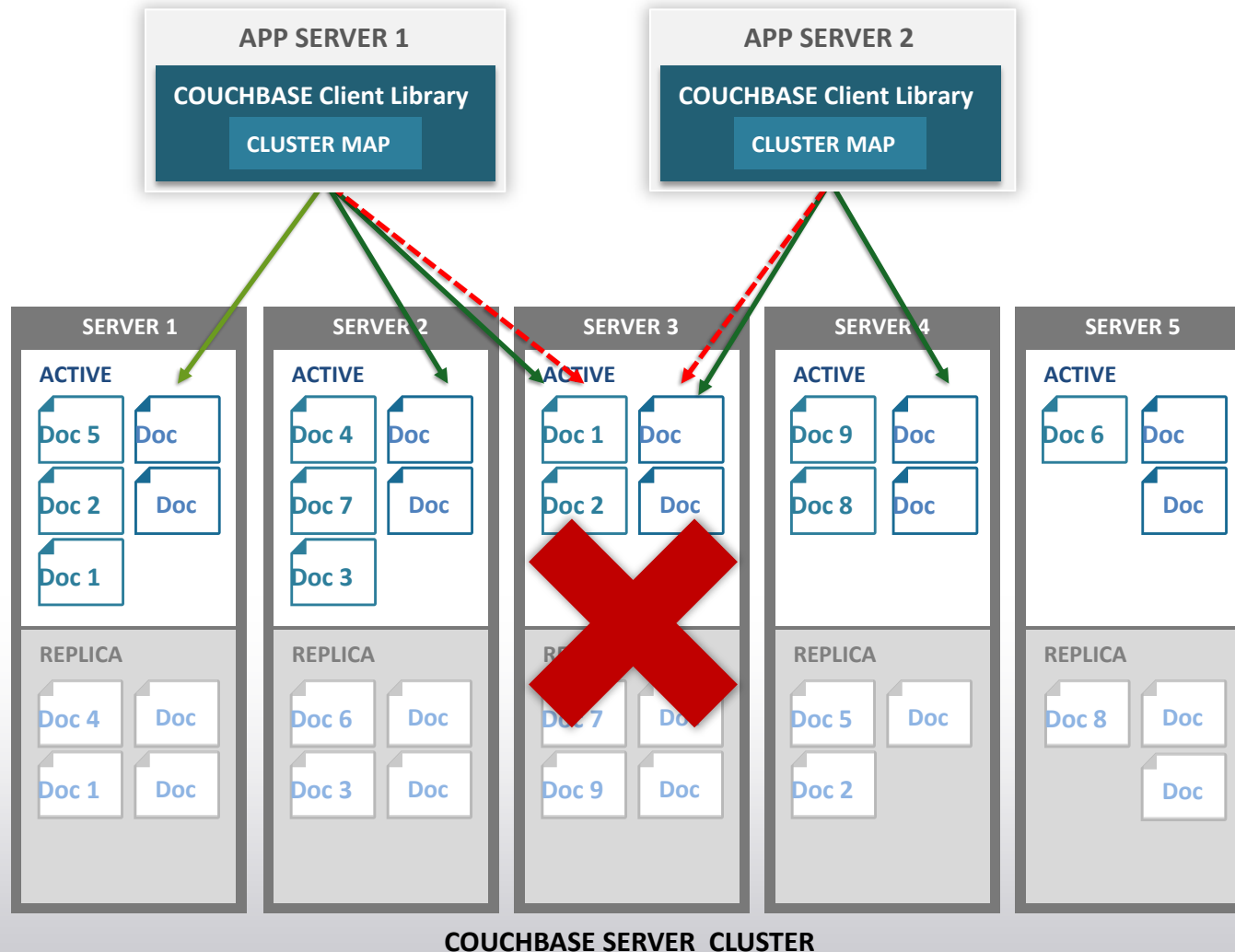
- Docs distributed evenly across servers
- Each server stores both active and replica docs
Only one server active at a time
- Client library provides app with simple interface to database
- Cluster map provides map to which server doc is on
App never needs to know
- App reads, writes, updates docs
- Multiple app servers can access same document at same time

Add Nodes to Cluster



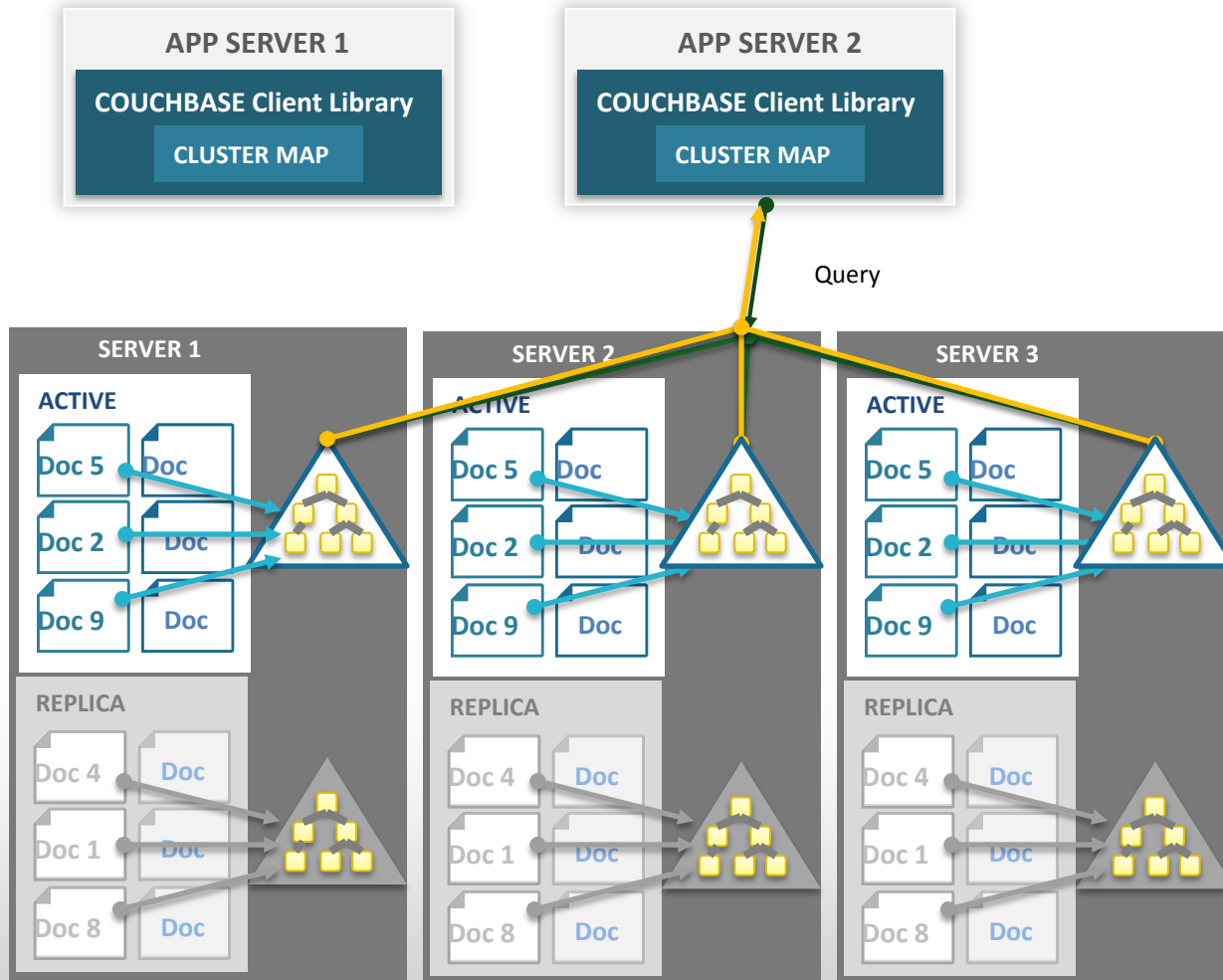
- Two servers added
One-click operation
- Docs automatically
rebalanced across
cluster
Even distribution of docs
Minimum doc movement
- Cluster map updated
- App database
calls now distributed
over larger number of
servers

Fail Over Node



- App servers accessing docs
- Requests to Server 3 fail
- Cluster detects server failed
 - Promotes replicas of docs to active
 - Updates cluster map
- Requests for docs now go to appropriate server
- Typically rebalance would follow

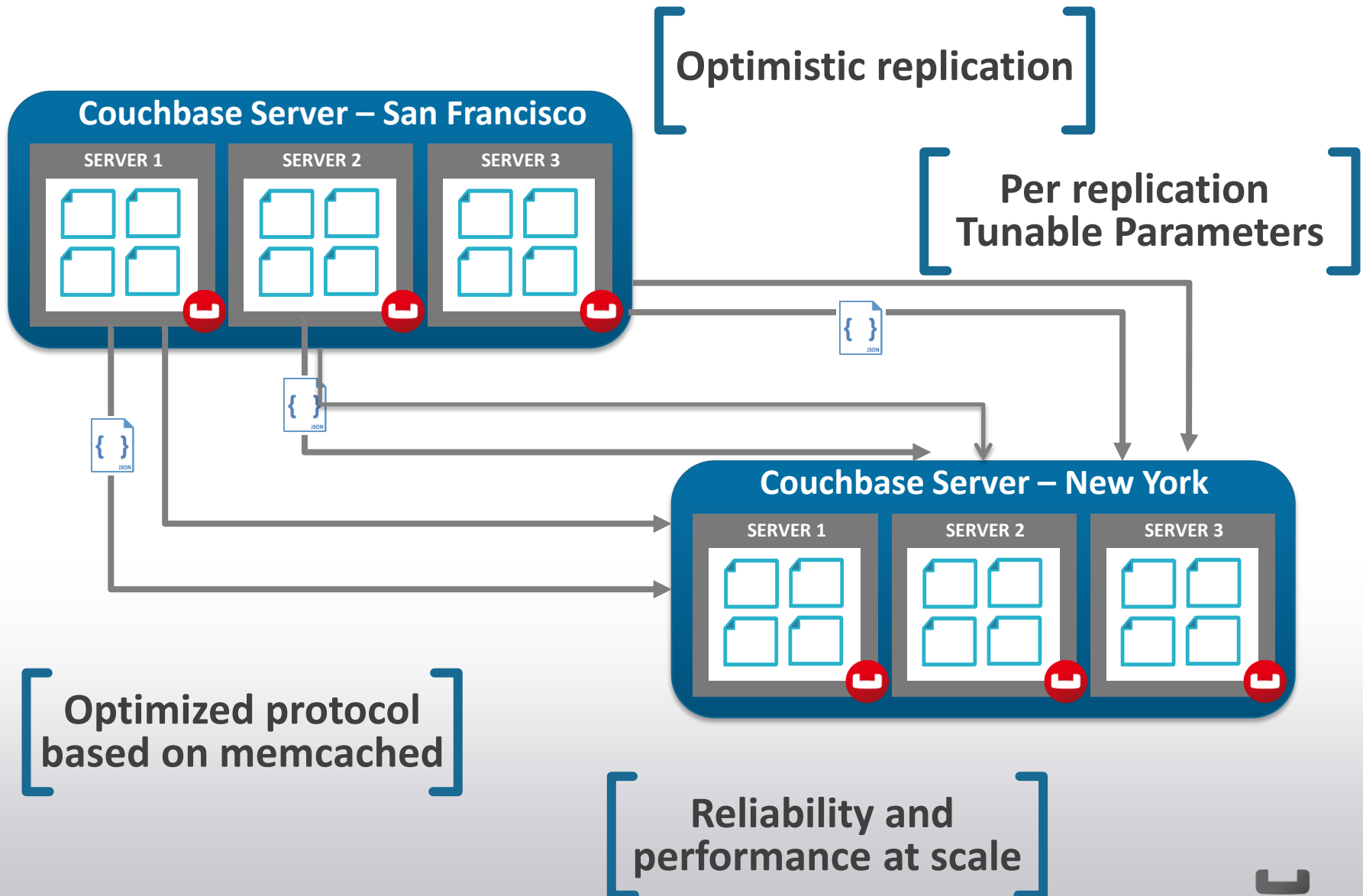
Indexing and Querying



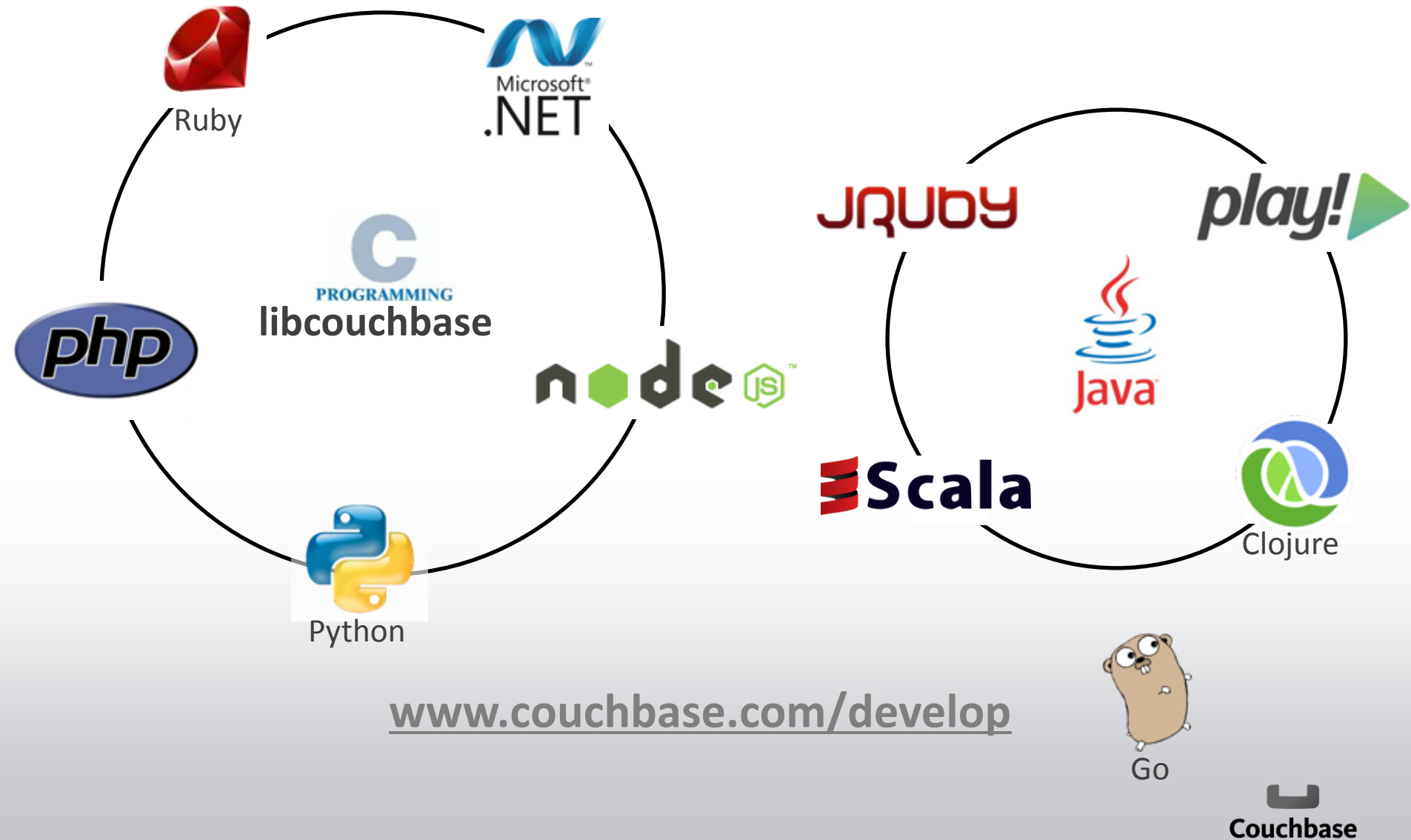
COUCHBASE SERVER CLUSTER

- Indexing work is distributed amongst nodes
- Large data set possible
- Parallelize the effort
- Each node has index for data stored on it
- Queries combine the results from required nodes

Cross Data Center Replication (XDCR)



SDKs





Couchbase & PHP

Official PHP SDK

- **Current Release: 1.2.1 (October 2013)**
- **Based on top of libcouchbase**
- **Does the heavy lifting for you**
 - Knows the cluster topology
 - „Routes“ operations to target servers
 - Abstracts protocol semantics (memcache, http,...)

Integration

- **Doctrine Cache Provider**
 - Since 2.4
- **Fully featured ODM in the making**
- **For now, try Basement!**
 - <https://github.com/Basement/Basement>



Demo Time!



Questions?



Couchbase